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ABSTRACT

Methodology and findings are summarized for a three-year research project undertaken by a consortium of 28 Northern California (Ncr Cal) community colleges to identify and help the potential dropouts among full-time, entering freshmen. The report first discusses the creation of the Nor-Cal consortium and then examines each of the three research phases: (1) a descriptive phase (1968-1969), in which the persistence of 28,000 entering students who had completed a biographical questionnaire based on a review of attrition literature was monitored; (2) a predictive research phase (1969-1970), in which an instrument to identify dropout potential was developed on the basis of Phase I findings; and (3) an experimental phase (1970-1971), in which the effectiveness of various techniques used to reduce attrition among identified high-risk students was tested. Results for each phase are summarized. The report concludes with a statistical examination of the validity of the predictor instrument, and a discussion of the techniques employed and the success achieved by each of the colleges in their attempts to aid potential dropouts during the experimental phase. Bibliographies dealing with the Nor Cal project and attrition in general are appended. (JP)

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Historical Highlights of the Three-Year Nor Cal Attrition Reduction Effort

An Overview, from a Perspective That Overlooks Ten Years, of the Highlights of a Three-Year, California Community College Research Consortium Effort to Reduce Attrition Among First-Time, Full-Time Freshmen

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INTRODUCTION

There presently exists more than 1,000 pages, scattered in dissertations and separate documents, that are directly related to the Three-Year Nor Cal Attrition Reduction effort. This document is an attempt to present some of the highlights of the consortium effort in a condensed and more readable form. The three-year study itself was completed in the summer of 1971. The passage of the past nine years affords a long-term view of the attrition reduction study.

It is hoped that this "review" will make it possible for more readers to become familiar with at least the "high points" of the Nor Cal dropout investigation that have been conducted and placed in separate documents in the public domain.

Finally, it is noted that nowhere does there exist a review of how the Nor Cal Consortium began nor why it chose student attrition as its first problem area to investigate. In addition to presenting the highlights described above, this paper describes these early workings of the Consortium and thereby gives credit where credit is long overdue.

CHAPTER 1 - THE EVOLUTION OF THE THREE-YEAR NOR CAL ATTRITION REDUCTION STUDY

Section 1 - What Was the Three-Year Nor Cal Attrition Study?

The Three-Year Nor Cal Attrition Study represents one of the most broadly based attacks on the "revolving door" problem ever to be undertaken in the public community college, at least in California and possibly in the entire nation.

During Phase 3 of the Three-Year Nor Cal Attrition Study the research consortium included twenty-eight (28) California community colleges. In terms of students involved, each year for the three years, between 22,000 and 28,000 first-time, full-time day California community college freshmen took the Nor Cal questionnaire. In the northern region of California, more than one out of every two colleges participated, and more than one out of every two first-time, full-time freshmen participated. In terms of the entire state of California, one out of every three community colleges participated[1] and more than one out of every seven first-time, full-time freshmen participated.

Section 2 - How Did the Nor Cal Research Consortium Develop?

Of course, the Nor Cal Research Consortium went through several stages of development. The spark of the Nor Cal Consortium idea was struck in the summer of 1966 when the California Junior College Association, through the efforts of Dr. Thomas Mersen, sponsored a U.S.O.E. summer workshop for institutional researchers at the University of California at Berkeley.[2] The following people attended that summer workshop and later organized themselves into the first nucleus of the Nor Cal Steering Committee:

1) Mrs. Lorine Aughinbaugh, then the Assistant Dean for Research at American River College.

2) Mrs. Virginia Murdoff, then the Dean of Student Services at Napa College.

3) Mr. Martin Taylor, then the Dean of Student Personnel at Sierra College.

4) Dr. Lee A. Stevens, then the Associate Director of Institutional Research for the Foothill Community College District - currently President of Golden West College.

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[1] The individual community college representatives to the Nor Cal Consortium, whose efforts helped make the broadly based consortium level effort a success, are listed in Appendix 1 of this paper.

[2] Over the years much support has come from the Office of the Chairman of the Research and Development Committee of the California Junior College Association. Gratitude is now expressed to the following people for their support of cooperative research via consortium-level effort: Dr. Frank Pearce, President of Long Beach City College; and Dr. Thomas F. MacMillan, Mendocino College.

5) Dr. E. Lance Rogers, then the Director of C.O.I.L. (Center for Independent Learning) and Tutorial Programs at the City College of San Francisco.

6) Mr. Marvin Veregge, then an Instructor-Counselor at Chabot College.

7) Dr. Frank Pearce, then the initial research conference workshop leader - currently President of Long Beach City College.

After the 1966 summer workshop at University of California at Berkeley, these seven people organized a planning committee in the academic year 1966-67.

In this state of development, five new members were added:

1) Mr. Walter Brooks, then a Counselor and Researcher at Shasta College.

2) Dr. Dayton Axtell, then a Counselor at Merritt College.

3) Dr. James Keene, then the Dean of Research at San Joaquin Delta College.

4) Miss Katherine Farley, then the Psychometrist at Merritt College.

5) Dr. Martin Olivarri, then the Registrar at Diablo Valley College.

During the following two academic school years, meetings of the Planning Committee were held at Napa College, American River College, City College of San Francisco and Cabrillo College. During that time funding was sought, the Phase 1 questionnaire[3] was constructed, and Dr. Thomas F. MacMillan, then a faculty member at Napa College and also a "Kellogg" student in the University of California's Junior College Leadership Program at Berkeley, was chosen to be the Project Director. Grantsmanship activities were so successful that multiple year funding was actually attained[4] and the Three-Year Nor Cal Attrition Study was essentially underway.

Membership in the Nor Cal Steering Committee has remained fairly constant over the next three years. Two members were unanimously voted into office at the June 1971 meeting at Solano College. These new members were:

1) Dr. Paul Preising, then the Director of Research at San Jose City College, and

2) Dr. Patricia Hertert, then the Instructional Resources Consultant for the Yosemite Community College District.

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[3]The Phase 1 questionnaire is presented in this report in Appendix 2.

[4]Dr. Lee A. Stevens now of Golden West College must be given credit for successful grantsmanship which provided the financial support.

As of Fall 1971, Mr. Walt Brooks, then the Director of Research at Shasta College, succeeded Mrs. Lorine Aughinbaugh as Chairperson of the Nor Cal Steering Committee. Then, in July 1973, Mrs. Virginia Murdoff, formerly Dean of Students at Napa College, became the Nor Cal Steering Committee Chairperson.

Section 3 - Why Was the "Revolving Door" Problem Chosen as the First Area of Investigation?

The "revolving door" problem was chosen as the first area of investigation because heavy and early attrition was thought to conflict with three major goals of the community college:

1) The attainment of equal educational opportunity,

2) The attainment of universal higher education, and

3) The attainment of the highest quality of community college education possible.[5]

If an intensive and massive three-year study of attrition were to be undertaken cooperatively by twenty-two (22) Northern California community colleges, then certainly the focus must be on what seemed to be a very detrimental form of attrition. An in-depth review of the literature and the consortium-level sharing of common experiences produced the consensus that heavy and early attrition was among the most detrimental. Hence, the Nor Cal Consortium would concentrate on keeping the first-time, full-time day students in college during the first risky semester or quarter of their attendance so that they would be more likely to "survive" for a longer period.

The magnitude of the attrition problem is such in the state of California that in 1970-71 the Coordinating Council for Higher Education (CCHE) for the state of California placed attrition at the top of the list of priority problems facing higher education in the state. Like the 1970-71 CCHE members, the members of the early 1967 Nor Cal Steering Committee believed the "revolving door" problem was one of the major problems facing community college education. Table 1 presents national data available at that point on the "revolving door" problem. As the table shows, the "revolving door" problem certainly seemed to exist nationally.

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[5]Part of the goal of attaining high quality is raising the level of cost effectiveness. Clearly one of the reasons for choosing attrition as a problem area was that attrition could be viewed as costly not only for the college but also for the student who dropped out.

TABLE

The Year of Freshmen Enrollment is:[6]

	Freshman Enrollment	Sophomore Enrollment	Member Withdrawing	Attrition Rate
1959	188,800	75,369	113,431	60.1%
1960	168,827	87,843	80,984	48.0%
1961	191,876	93,433	98,443	51.3%
1962	211,897	101,436	110,461	52.1%
1963	233,612	113,901	119,711	51.2%
1964	294,855	149,878	144,977	49.2%
1965	395,621	191,965	202,656	51.4%
1966	458,727	215,656	243,071	53.0%

One major difficulty that surrounded the "revolving door" problem had to do with rhetoric regarding the sincere desire to more nearly attain two goals, (1) equal educational opportunity and (2) universal higher education. There was evidence to suggest that unequal educational opportunity did exist. As Medsker had noted as far back as 1960, there was a high correlation between social class and college attendance.[7]

At the time of the planning of the first Nor Cal Consortium-level investigation, it was known that college attendance and enrollment patterns were not the same across socio-economic levels. Slightly more recent data on the phenomena of unequal educational opportunity were available. They indicated that the problem still existed after the Nor Cal study had ended. As of March 1971, the U.S. Commissioner of Education, Sidney M. Marland, Jr., unveiled the following information on college entrants rates by brackets of annual income. These unequal enrollment rates tend to confirm the suspicion that unequal educational opportunity did exist in America. (U.S. News and World Report, March 8, 1971)

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[6] American Council on Education "Profiles of College Freshmen Enrollments," 1959-1966.

[7] Kate Mueller and John H. Mueller, "Class Structure and Academic and Social Success, "Educational and Psychological Measurement, Vol. 13, No. 3, pp. 468-497, Autumn 1953. As quoted in Medsker, 1960.

Percentage of High School Seniors Entering

College by Brackets of Annual Family Income

$15,000 and over	86.7%
$10,000 - $15,000	61.3%
$ 7,500 - $10,000	51.0%
$ 3,000 - $ 7,500	37.7%
Less than $ 3,000	19.8%

While in the early stages of planning, the exact nature of the profile of students most likely to move through the "revolving door" of the open-door colleges were not known; it was strongly suspected that those students would represent the lower socio-economic levels of American society. If this should prove to be the case, the "revolving door" problem should be attacked and solved with the purpose of more nearly attaining the goal of creating more equitable educational opportunity.

A second major difficulty that surrounded the "revolving door" problem had to do with the rhetoric regarding the goal of universal higher education. Early on, Dorothy Knoell observed that, "Providing universal higher education beyond high school is a national commitment." (Knoell, Dorothy M. 1966) A Presidential Commission on Higher Education appointed by President Truman had, in 1947, estimated that forty-nine (49) percent of the population had the mental ability to complete two years of postsecondary schooling. If universal higher education were to be a national goal, and if almost half of the population had the mental ability to complete two years of community college education, then high attrition rates represented an obstacle to the attainment of this national goal. This is not to say that progress had not been made in this direction, for in a way this goal was being approximated. In the year 1900, only 3 percent attended college as compared to 31 percent in 1939, 43 percent in 1950, 48 percent in 1955, 50 percent in 1960, and 54 percent in 1962. (Collins, Charles C., 1966 and McGrath, Earl, 1966) On the other hand, if only half of the high school graduates were entering college, if only half of these returned after the first year in community college, only 25 percent of the high school graduates were making it as far as their sophomore year in the community college. This seemed to be a far cry from the 49 percent level the 1947 Presidential Commission had said could benefit from, not one, but two years of postsecondary schooling.

As Medsker, Tillery, and Collins had pointed out, if the percentage of high school graduates who attend American colleges were to increase from 50 to 60 to 70 percent, the press would likely be on the community college segment of higher education. The obvious question was, "Are community colleges ready to do the lion's share in seeing to it that the national goal of universal higher education could be more nearly approximated?" By proving that the "revolving door" problem could be reduced, the Nor Cal Consortium showed that community colleges could do the lion's share of the work involved in attaining universal higher education in line with President Truman's 1947 Commission findings.

A third major difficulty that surrounded the "revolving door" problem had to do with the unique way the community college defined its role and its quality. High attrition rates seemed to indicate that community colleges might be functioning

like little universities in trying to get rid of students rather than help them finish their academic programs. If a high percentage of entering freshmen took only a brief look at the community colleges and then left, the following question had to be raised: "Is the quality of education as high as it should be?" As Tillery and Medsker would later write:

> "It has taken courage for these community colleges, to define their quality by what they can do for students who need help rather than by what students can bring to them from the competitive market place of high achievers." (Tillery and Medsker, 1971, p. 82)

It is precisely because community colleges appeared to have decided to define their quality by "what they can do for students who need help" that they became concerned about the "revolving door" problem. Perhaps community colleges had taken the revolutionary approach of trying to "fit" the college to the students, rather than fitting the students to the college. (Cross, K. Patricia, 1969)

Given these revolutionary definitions, it seemed apparent that community colleges existed to serve the needs of students who enrolled, and if a large proportion of entering freshmen went through the "revolving door," then the community college had not successfully "fitted" itself to those dropouts. The attrition problem reflected on the quality of the instituion, and its ability or inability to adapt to the students who enrolled.

There were four major reasons for investigating the "revolving door" problem and trying to solve it. First, if as was strongly suspected, students who had attitudes like students from lower socio-economic levels were the ones who were passing through the "revolving door," then even a partial solution of the "revolving door" problem would mean, (1) the attainment of more equal educational opportunity. Second, if community colleges could prove that they could overcome, or at least reduce, the "revolving door" problem, it would at the same time demonstrate their capability of playing a major role in, (2) the attainment of the goal of universal education. Finally, since by its unique definition of its role and quality, community colleges were endeavoring to "fit" themselves to their students, overcoming the "revolving door" problem would demonstrate, (3) the attainment not only of the high quality of the institutions but also, (4) the appropriateness of these unique definitions.

Section 4 - What is the Importance of the Three-Year Nor Cal Attrition Study?

The Three-Year Nor Cal Attrition Study is important for many reasons. First, it proves that potential dropouts can be identified and helped before they terminate their attendance. Second, it proves that California community colleges can cooperate in doing consortium-level research into meaningful problem areas. Third, by proving that the "revolving door" problem can be at least partially overcome and many potential dropouts can be helped, the community colleges involved have demonstrated their willingness and ability to do their part toward more nearly attaining equal educational opportunity, universal higher education,

and the highest quality of community college education. If and when state and federal governments decide to provide adequate financial support for the better attainment of these goals, the community colleges have already demonstrated that they are able to do their part.

Section 5 - What Was the Research Design for the Three-Year Nor Cal Attrition Study?

A quote from Dorothy M. Knoell is most appropriate:

> "...most studies of junior college students are descriptive (normative), correlational (predictive), or evaluative (only occasionally experimental)." (Knoell, Dorothy, 1968)

In order to attack the "revolving door" problem and prove that potential dropouts could be identified early and helped before they withdrew, it was necessary for the Nor Cal Attrition Study to be a study that included all of the above. Because the Three-Year Nor Cal Attrition Study would have to be descriptive, predictive, and experimental, it was divided into the following three phases—each of which took one year to complete:

1) Phase 1 (1968-1969): - Descriptive Research,

   Goal: Describe the characteristics of first-time, full-time, day freshmen who discontinue their enrollment during their first semester or quarter.

2) Phase 2 (1969-1970): - Predictive Research,

   Goal: Develop and validate an instrument that will identify first-time, full-time, day freshmen who have high dropout potential.

3) Phase 3 (1970-1971): - Experimental Research,

   Goal: Conduct experimental and quasi-experimental[8] research-designed studies at the individual colleges in an effort to overcome the "revolving door" problem and help potential dropouts.

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[8] It was clear that in order to reach potential dropouts, the institution had to know who the potential dropouts were before they dropped out. A diagnostic instrument was obviously needed. Furthermore, attrition had to be operationally defined so that a criterion would exist against which to validate questionnaire items that could be answered at the time the students enrolled. The following operational definition of attrition emerged: "A student was considered to be a dropout if he was a first-time, full-time (12 or more units) day student in the fall quarter or semester, and before the end of that initial quarter or semester, he had completely dropped all of his units." It was in this way that a very detrimental form of attrition was attacked.

CHAPTER 2 - WHAT WERE THE FINDINGS OF THE FIRST TWO PHASES?

During Phase 1, the first year of the Nor Cal Attrition Study, 28,000 community college freshmen completed a very extensive bibliographic questionnaire upon entry into the Nor Cal community colleges.[9] The items on the extensive questionnaire had been derived from the literature on dropouts. The persistence or attrition behavior pattern of the 28,000 students who completed the questionnaire was observed during the fall term of the 1969 and the students' responses to the three-page questionnaire were compared to the criterion—"which students dropped out?" Extensive statistical analysis followed and items shown to correlate with dropping out were discovered. The discriminating questions later made up a one-page "Nor Cal 'Dropout Prone' Diagnostic Questionnaire" which was used in Phase 2 and Phase 3. These and other results of Phase 1 were published. (MacMillan, Thomas F., 1969a and 1969b)

The Nor Cal questionnaire items that emerged successful did have a diagnostic capability of identifying potential dropouts before they in fact dropped out. The five most powerful, predictive variables were: SexAbility, Race, Goals, Parental Encouragement, and Importance of College to Self. Thus, as initially suspected, the students who were likely to pass through the "revolving door" were shown to have the following characteristics: (MacMillan, Thomas F., 1969)

1) SexAbility: On the variable of SexAbility, the potential dropout is most likely to be a low ability male, least likely to be a middle ability female.

2) Race: On the variable of Race, the potential dropout is most likely to be black, least likely to be oriental.

3) Goals: On the variable of academic Goals, the potential dropout is most likely to have lower educational goals than the persister.

4) Penc: On the variable of Parental Encouragement, the potential dropout is most likely to receive little parental encouragement for his college plans; and finally,

5) Imps: On the variable fo Importance of college to self, the potential dropout is most apt to have a low sense of the importance of college.

It is important to note that in the above list, variables 1, 3 and 5 had the heaviest weightings in the predictive equation. That is to say that, SexAbility, Goals, and Importance of College to Self were more heavily weighted.

It was clear from the first two years of the Nor Cal Attrition Study that the two best indicators of early potential withdrawal are the factors of:

1) SexAbility, and

2) Motivation.

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[9]The three-page questionnaire is shown in Appendix 1.

In this list, Motivation included the factors of Goals, Parental Encouragement and Importance of College to Self.[10] Of these two factors, the Motivation factor was shown to be at least as important as the SexAbility factor. This profile of the potential dropout of the community college may be considered as one reads the following:

A Potpourri of Relevant Quotations

A. "...educational systems have been so organized as to give all the prizes to children from 'good homes'..." (Hutchins, Robert M., The Learning Society. Mentor, 1969, pp. 29, 35)

B. "...the major assignment of the Community College is to extend educational opportunity." (Gleazer, Edmund J., This is the Community College, p. 46)

C. "....ut equal opportunity and wide participation in higher education involve more than merely lowering the barriers to admission. There is ample evidence, for example, that postsecondary education is not meeting the needs of many students...Some students are deprived of opportunity because of where they live, their racial and ethnic backgrounds, their financial resources, and because of non-academic interests and school histories...Some of the rhetoric about universal higher education deludes both policy makers and educators and makes false promises to those who have yet to enter the mainstream of American life..." (Tillery and Medsker, 1970, pp. 138-139)

D. "...the College should be distressed by its students who live up to a prediction of failure, not elated by its selection of good predictive instruments!" (Knoell, Dorothy M., AAJC Newsletter No. 21, November 22, 1968, p. 1)

E. "...the emphasis primarily on academic transfer programs with anemic attention paid to other stated goals must of necessity transform the 'open door' concept into a 'revolving door' actuality." (Cosand, Joseph P. in Tillery and Medsker, 1971, p. 157)

F. "...SCOPE findings, to date, suggest that many junior college youths are marginal students, not only because of economic pressures and lack of incentives at home, but because they themselves are not sure they can make it. Compared to their peers in senior colleges, they have had only modest success in high school, less than satisfying guidance experiences, and continuing doubts about their ability to do college work." (Tillery and Medsker, 1971, p. 83)

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[10] Parental Encouragement as a factor, and Importance of College to Self as a factor which discriminated persisters from withdrawers was also identified in the Trent and Medsker Study. (Trent, James and Leland Medsker. Beyond High School, 1964, pp. 106 and 115) But to know what some factors might be was of course not enough. Precise factors had to be proven to be correlated with attrition in the cooperating community colleges. Later, these factors were weighted appropriately through the use of a multifactor, predictive equation.

G. "...as barriers to educational opportunity are eliminated, students in need of help will 'flood the community colleges and greatly exacerbate the present problems of providing developmental and remedial training...' " (Collins and Collins, 1966)

H. "...mankind has become so much one family that we cannot insure our own prosperity except by insuring that of everyone else. If you wish to be happy yourself, you must resign yourself to seeing others also happy." (Russell, Bertrand, The Science to Save Us From Science, 1950, p. 33)

During Phase 2, the test items from the five most powerful predictive factors which discriminated the dropouts from the persisters were combined into a single one-page questionnaire which was administered to 22,000 entering Northern California community college freshmen. The Phase 2 validation study was conducted, and an empirical validity of .65 to .67 was attained. Again the results were placed in the public domain. (MacMillan, Thomas F., 1970)

In summary, the findings of the first two phases of the Three-Year Nor Cal Attrition Study indicated that potential community college dropouts had certain characteristics which, when measured and appropriately weighted in a predictive equation, permitted the students' identification as potential dropouts to take place before they did dropout. The profile of the potential dropouts was such that it called and continues to call into question the community college's actual attainment of the goals of: (1) equal educational opportunity, (2) universal higher education, and (3) the delivery of the highest quality of community college education.

CHAPTER 3 - WHAT WERE THE FINDINGS OF THE THIRD PHASE?

As will be recalled, the third phase of the Nor Cal Consortium-Level Attrition-Reduction effort was to be the experimental phase of the study. During this phase, participating community colleges were encouraged to use a true experimental design to see if their special efforts aimed at encouraging potential dropouts to remain in their college were successful or not. The major findings of the third phase were in relation to the main question: "How successful were we in reducing the dropout rate among those potential dropouts in our experimental group?" However, before the main question could be investigated, the second validation of the Nor Cal diagnostic instrument was undertaken and completed.

Section 1 - Second Validation of the Nor Cal Dropout Identification Questionnaires

The first validation study of the questionnaire had been conducted during Phase 2 (1969-1970) of the Nor Cal Attrition Reduction Effort. The results of this initial validation are shown in the table below. (MacMillan, Thomas F., 1970)

TABLE

Results of the First Validation

College	Test Used	WD Yes	Persist Yes	WD NO	Persist No	Valid
American River College	ACT	27	1469	30	722	.665
Butte College	None	17	145	29	104	.549
Cabrillo College	ACT	0	226	1	62	.782
Chabot College	ACT	16	208	31	45	.746
City College of San Francisco	SCAT	78	566	80	282	.640
College of San Mateo	SCAT	40	1070	38	492	.677
College of the Sequoias	ACT	33	638	40	286	.312
Contra Costa College	COOP	13	111	2	103	.541
DeAnza College	ACT	26	629	36	314	.652
Diablo Valley College	None	27	640	67	243	.683
Foothill College	ACT	18	549	20	199	.721
Laney College	SCAT	34	234	37	165	.570
Merced College	None	15	78	13	44	.620
Merritt College	SCAT	13	191	21	80	.668
Monterey Peninsula	COOP	36	359	28	204	.629
Napa College	ACT	19	272	21	130	.658
Ohlone College	ACT	4	90	3	34	.717
Porterville College	ACT	14	214	10	139	.604
San Joaquin Delta	None	79	1135	95	478	.679
San Jose City College	COOP	55	546	74	385	.567
Sierra College	ACT	11	589	13	287	.666
Yuba College	ACT	38	216	22	191	.544

TOTAL = .65	COOP = .59	WD Only = .46
ACT = .67	None = .67	Persist Only = .67
SCAT = .65		

This first validation study showed that the consortium-wide empirical validity varied from .65 to .67 depending upon whether or not the ACT aptitude test scores were incorporated into the predictive equation. In terms of the initial validation, the research question was, "What proportion of first-time, full-time freshmen was correctly identified by the Nor Cal Questionnaire predictive equation as either potential dropouts or potential persisters?" In this validation study the operational definitions were as follows: "Given that the Sum-1 scores range from +45 to -45, a 'potential dropout' is one who has a discriminant score of above 0, while a 'potential persister' is one who has a Sum-1 discriminant score of below 0." Thus a fairly high level of predictive validity (.65 to .67) was attained even when a "cutting score" of zero (0) was used.

However, as Phase 3 began, a Fisher's exact Z test was performed on the consortium-wide data to test the question, "Do students who have a positive diagnostic score (0.5 to +45) drop out at a higher rate than those who have a negative diagnostic score (-0.5 to -45)?" As shown below the attrition rates were not equal; those with "plus scores" did have a higher attrition rate. (Kester, Donald, 1971). This is shown in Table below.[11]

TABLE

Nor Cal Consortium Level Validation

Using Zero (0) as Cutting Score

	Sum-1 Scores	
	Below 0	Above 0
Withdrew	711	613
Persisted	10175	4989
Total	10886	5602
Attrition Rate	6.53%	10.94%

$X^2 = 97.42$

$Z = 9.87$

$p = .0001$

$\phi = .02$

The results were disappointing. For, however statistically significant the difference was ($p < .0001$), a difference of 4.41% between the attrition rate of those students having positive diagnostic scores (10.94%) and those having negative diagnostic scores (6.53%) was not very meaningful in terms of identifying potential

[11] This comparison was undertaken at the suggestion of Dr. Thomas F. MacMillan, the consortium-level Project Director during the first two phases of the study.

dropouts for placement in special, experimental programs during Phase 3, The Experimental Phase. When the phi coefficient, (ϕ), recommended by Marascuilo was determined to be less than .05 it was concluded that using zero (0) as the cutting score resulted in a statistic (ϕ), which showed almost no degree of association between a student's having a positive or negative score and subsequently dropping-out. (Marascuilo, 1971, pp. 401-412). Thus, as Phase 3 began, a cutting score of zero (0) enabled identification of subjects correctly as either dropouts or persisters, at .65 or better; but it identified dropouts, only, at .46; a level below flipping a coin.

This situation forced the formation of a new, more Phase 3 relevant research question: "Do students who have discriminant Sum-1 scores of +10 or higher, differ in their performance levels from other students?"[12] At first the question centered only on the differences in attrition rates between identified potential dropouts and other groups. But when five community college representatives indicated their willingness to investigate units completed in addition to attrition, the new research question was broadened to include comparisons using both.

The second validation, then, was concerned with comparing attrition rates, and units completed, between groups of entering freshmen from whom Sum-1 scores were known. These comparisons would be made between potential dropouts, those having discriminant Sum-1 scores of +10 or higher and other groups. (Kester, Donald L., "Further Validation of the Nor Cal Questionnaire")

As shown in the Table below, the "plus ten students" withdrew at a rate almost twice that of the other students.

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[12]The possibility of using a Sum-1 discriminate score above zero, say +5 or +10, was initially suggested by Dr. Thomas MacMillan.

TABLE

Summary of "Attrition Rate" Comparisons for the Second Validation Study and Display of Ratio of Attrition Rates for the Two Groups

College	Measurement Taken After	Attrition Rates: Group A Sum-1 +10 or Above	Attrition Rates: Group B Sum-1 Below -10	z Value	Significance Level p	Ratio of Attrition Rates Gr A/Gr B
Foothill	Fall Quarter 1969	25.0%	11.9%	3.12	.001	2.10
Foothill	Spring Quarter 1970	46.9%	37.1%	1.77	.140	1.26
De Anza	Fall Quarter 1969	25.6%	18.7%	1.98	.24	1.37
De Anza	Spring Quarter 1970	55.2%	34.0%	5.09	.001	1.62
San Jose	Fall Semester 1969	31.2%	20.8%	2.97	.015	1.50
San Mateo	Fall Semester 1969	10.9%	4.1%	4.00	.001	2.66
Merritt	Fall Quarter 1969	14.0%	6.2%	2.15	.015	2.26
San Jose	Academic Year 1969-70	45.2%	23.5%	4.28	.001	1.92

Mean ratio of attrition rates for all comparisons shown above = 1.87

Ratio of attrition rate for the one entire academic year = 1.92

Furthermore, the "plus ten students" completed fewerunits as the Table below shows. For Fall alone, the "non plus ten students" completed two and one-half (2.58) times as many units.

TABLE

Summary of "Units Completed" Comparisons for the Second Validation Study and Display of Difference in Units Completed for the Two Groups

College	Measurement Taken After	MEANS Group A Sum-1 +10 or Above	MEANS Group B Sum-1 Below -10	Value F Ratio of A nova Test	Signifi-cance Level p	Difference in Units Completed Gr A/Gr B
Foothill	Fall Quarter	7.70	10.49	11.58	.0005	2.79
	Winter Quarter	6.53	8.80	6.79	.005	2.27
	Spring Quarter	5.00	7.47	6.10	.005	2.47
	Academic Year	19.23	26.75	10.29	.0005	7.52
De Anza	Fall Quarter	7.86	10.29	11.88	.0005	2.43
	Winter Quarter	5.89	9.13	17.59	.0005	3.24
	Spring Quarter	4.83	8.23	18.58	.0005	3.40
	Academic Year	18.58	27.65	19.89	.0005	9.06
San Jose	Fall Semester	5.80	9.14	17.25	.0005	3.34
	Academic Year	9.19	16.44	19.76	.0005	7.25
San Mateo	Fall Semester	11.41	13.15	4.65	.025	1.74

Mean difference in units completed for Fall = 2.58

Mean difference in units completed for academic year = 7.94

Section 2: Summary of Findings From College Programs Which Used a True Experimental Research Design During Phase 3

Although all community college personnel who were participating in Phase 3 of the Attrition Reduction Study were encouraged to use what Campbell and Stanley refer to as "a true experimental design," some were forced by circumstances into using a quasi-experimental design or conducting a validation of the predictive powers of the diagnostic instrument as it applied to their first-time freshman. Twelve colleges were able to conduct a true experimental design. Eight colleges conducted a post-hoc, quasi-experimental study into the possible effects of an independent

treatment variable. Some colleges completed both a true experimental design and a quasi-experimental design. Nine colleges conducted further validation of the diagnostic instrument. (Some colleges were able to do this in addition to doing either a true experimental or quasi-experimental design.)

Each of the individual college descriptions of the findings during Phase 3 have been summarized, and are how presented in this summarized form. The name of each college is listed first, then the name of the person who was the local college project director, then the summary.

First to be considered are those college programs conducted under the rubric of a true experimental design. A listing of these colleges is shown in the table below. After the table is the brief description of each college's findings.

TABLE

Colleges That Used a True Experimental Research Design

College	Treatment Variables
American River College	Special Individual Counseling
Cabrillo College	Career Counseling
College of San Mateo	Learning Skills Course
Merritt College	Individual Counseling or a Special Course
Napa College	Special Individual Counseling
Ohlone College	Controlled Course Selection or Identification to Counselor
Porterville College	Special English Class or Group Counseling or Extra Individual Counseling
Reedley College	Recruitment, Pre-College Workshop, and Counseling
San Joaquin Delta College	Group Counseling
San Jose City College	Identification to Counselor and Intensive Individual Counseling or Intensive Counseling Without Identification
Shasta College	Identify to Counselor and Special Counseling
Sierra College	Identify to Counselor and Special Counseling

American River College (Mrs. Lorine Aughinbaugh):

Both a validation study and an experimental design were conducted. For the experimental condition, the Director of Research invited potential dropouts to meet with her to discuss problems they were facing. All such potential dropouts responded to the invitation and some of them came in for a second discussion. At the end of the fall term the potential dropouts who did come to see the Director of Research had a lower attrition rate ($p<.15$), and a higher reenrollment rate for the next term ($p<.10$) than did a control group.

Cabrillo College (Mr. John Hinton):

An experimental design was conducted in which the performance levels of three groups of students were compared. Students in the first experimental condition were placed in a counseling guidance section of "Orientation to College" that emphasized career planning. Students in the second experimental group were in one section of "orientation to college" in which they received more frequent counseling sessions than were accorded students in the usual "Orientation to College" section. Students in the control group were in a usual "Orientation to College" section. Results indicate that careers counseling appears to be a useful means by which high potential dropout students may be motivated or encouraged to complete their counseling courses ($p<.04$), reenroll in the subsequent session ($p<.04$), complete more units ($p<.005$), and earn higher grade point averages ($p<.10$) than the students who had the usual, (non-career) counseling through "Orientation to College" counseling course. Students in the second experimental condition had more frequent counseling sessions, had a lower attrition rate ($p<.04$), and completed more units ($p<.025$) than those in the usual "Orientation to College" section. However, more frequent traditional counseling had no significant impact on reenrollment of students in the subsequent session.

College of San Mateo (Dr. J. William Wenrich, Miss Jane Hanigan and Mr. Raymond Pflug):

Ninety-eight (98) first-time, full-time community college students identified as potential dropouts were randomly assigned to experimental and control groups. Those in the experimental group were actively involved in individual study programs offered through the Learning Center. Those in the control group received no special treatment. Those involved in the Learning Center had a lower attrition rate during the semester ($p<.10$), had more students who completed a full-time course load, had fewer students who failed to register for the second term ($p<.01$), had more students who achieved a C average in college and more students who did as well or better in college than they did in high school ($p<.05$). Subjective evaluation tended to support the notion that students involved in the Learning Center had learned to accept setbacks without regarding themselves as failures, to accept success as easily as failure, to become less dependent and more confident in themselves. Experimental treatment seemed to be strongly related to reduced attrition and generalized better performance.

Merritt College (Dr. Donald DeNevi):

A true experimental design was undertaken and accomplished at Merritt College. The independent experimental treatment variable consisted primarily of an experimental Psychology 86A class, multiple and individual counseling within the course, and intensive individual counseling outside the course. Random selection and assignment was used to form the experimental and control groups. At Merritt College these groups represented extra-high risk students since students were selected who had plus ten (10) or above on the Nor Cal Sum-1 index and also scored below the tenth (10th) percentile on the SCAT and English Cooperative tests. Students in Psychology 86A had a lower attrition rate ($p<.05$), a higher renerollment rate ($p<.01$), a higher grade point average ($p<.10$), and a higher mean number of completed units ($p<.01$) than did those students in the control group. This study indicates that the project meets the needs of Nor Cal potential dropout students who also scored below the tenth (10th) percentile on the SCAT and English Cooperative tests. The effects were investigated only through reenrollment in the second quarter. Follow-up studies should be conducted to determine what happened later. The evident success of the experimental Psychology 86A course with such extra-high risk students places a strong responsibility on Merritt College to continue and further elaborate on this course. It is hoped that other colleges in the Peralta District will move to initiate similar programs and that district-wide efforts to reach and support these students will be undertaken.

Napa College (Mrs. Gladys E. Dallas and Mrs. Virgnia Murdoff):

Two kinds of studies were conducted at Napa College. The first was a true experimental design, and the second a validation study. Within the true experimental design, the independent variable was special counseling services. Students in the experimental group who received the special counseling services were compared with students who received routine student services. These comparisons were made at the end of the fall quarter and at the end of the winter quarter. At the end of the fall quarter it was apparent that students in the experimental group who had received special counseling services had a lower attrition rate ($p<.01$), a higher reenrollment rate ($p<.01$), a higher mean grade point average ($p<.01$), and more units completed ($p<.01$). When the two groups were compared after the winter quarter, it was seen that those students in the experimental group had lower attrition rates during the winter quarter ($p<.01$), higher reenrollment rate for spring quarter ($p<.01$), higher grade point averages after winter quarter ($p<.01$), and more units completed after winter quarter ($p<.01$). The validation study at Napa College consisted of those students who were identified as potential dropouts by the Nor Cal questionnaire. The second group of students were matched with the Nor Cal identified potential droptouts on the variables of ACT test scores and sex. The comparisons were made after fall quarter and after winter quarter. Students identified by the Nor Cal questionnaires as potential dropouts did have a higher attrition rate after fall quarter ($p<.01$), a lower reenrollment rate after fall quarter ($p<.01$), a higher attrition rate after winter quarter ($p<.001$), and a lower reenrollment rate after winter quarter ($p<.001$). The Nor Cal identified potential dropouts completed fewer units after fall quarter

($p<.005$), completed fewer units after winter quarter ($p<005$), had lower grade point averages after fall quarter ($p<.005$), and had lower grade point averages after winter quarter ($p<.005$). There are two lessons to be gained from the Phase 3 Nor Cal Study as accomplished in Napa College; special counseling did help potential dropouts, and the Nor Cal questionnaire is valid.

Ohlone College (Mr. Clay Bell):

A true experimental design was performed at Ohlone College. Students identified as potential dropouts were assigned to one of two experimental conditions, each having a control group. The first experimental condition was a qualified entry program. This condition included a special college program designed to assist students of low academic potential. It required mandatory enrollment in Guidance 2, Orientation to College. Comparison of attrition rates of students in this experimental condition as compared to the control group indicated that those in Guidance 2, Orientation to College, had a lower attrition rate ($p<.01$). For the second experimental group potential dropout students were identified to their counselors as high risk students. When the students so identified were compared with students who were also potential dropouts and who were not identified, it was learned that those identified to counselors had a lower attrition rate ($p<.02$). It was further learned that students identified to their counselors completed more units than their untreated controls ($p<.10$). It is recommended that in the future screening for qualified entry program should be complemented with the Nor Cal questionnaire screening. There is evidence to suggest that the mere identification of potential dropouts to counselors has some effect in preventing attrition.

Porterville College (Mr. Albert M. Cano):

An experimental design was conducted and the following services were offered to the students assigned to the experimental group:

1. Special counseling in a group psychology class,
2. Special English classes, and
3. Individual counseling by four trained specialists.

The difference between the experimental and control groups would be the exposure of the former group to extensive counseling and special class work. Essential to the entire process was the attempt to emphasize the fact that students' problems were not confined strictly to those found within academic areas. Between the first and second semesters, the attrition rates of the potential dropouts in the experimental group was reduced ($p<.14$), the reenrollment rate was increased ($p<.14$), and the mean grade point average was increased ($p<.10$). Plans for the future include expanding the treatment with the possible use of a tutorial program which would be utilized over a greater length of time. If community college personnel are really sincere in their desire to reduce the attrition rate among

community college students, it is seen as essential that qualified researchers be given an opportunity to carry on studies in the field of attrition reduction. The Nor Cal Study and other studies will provide the tools by which the rate of college withdrawals can be reduced.

Reedley College (Mr. Robert Clark):

Three kinds of studies were conducted for Reedley College. The first was a true experimental design. The second was a post-hoc, quasi-experimental design, and the third was a validation study. For the true experimental design, students in the experimental condition were chosen under the auspices of a project under SB164. It consisted of recruiting minority students with academic potential but with little possibility of continuing their education past high school. The recruitment was supervised by a faculty director and carried out by students of Mexican-American descent during the spring 1970 semester. The recruiters worked in the high schools from which they graduated and knew the students among whom they recruited. A control group was developed by matching Nor Cal Sum-1 index, ethnic background, and sex. Experimental treatment consisted of recruitment, a two-week readiness workshop, and support during their attendance. During the workshop, those in the experimental group were housed in college residence halls together with nine student-staff members. Board and room for the two weeks was furnished the students along with a stipend of $70. At that time orientation of the world of work and education was presented along with introduction to study skills and expectancies of college teachers as related to student performance. Comparison of performance levels of the two groups indicated that at the end of the first semester, the control group had attained a significantly higher grade point average ($p<.015$). The recruiters seemed to be successful in identifying those students who would have difficulty in college. Unfortunately, data was not collected during the entire freshmen year for inclusion in this report. It may be that the experimental condition did have an effect over the freshmen year but it was not apparent at the end of the first semester. It is recommended that evaluation continue on experimental and quasi-experimental treatment conditions until all members of experimental and control groups are no longer in attendance.

San Joaquin Delta College (Dr. James Keene and Mrs. Elizabeth Lee):

A true experimental design was conducted. Counselors agreed to individually counsel groups assigned to the experimental group and follow-up with group sessions with these students. Although this experimental condition was not applied early in the semester, it was shown that students in the experimental group had a lower attrition rate ($p<.08$) and a much higher reenrollment rate ($p<.0002$) than did other potential dropouts who were not so identified and not contacted by the counselors. The importance of having contact with counselors is obvious.

San Jose City College (Dr. A. Gordon Peterson):

A true experimental design was conducted. Potential dropouts were randomly assigned to one of three conditions:

1. Identified and assigned to one of three counselors to receive intensive counseling service, identified as Experimental Group 1 (E1), Experimental Group 2 (E1), and Experimental Group 3 (E3).

2. Unidentified but assigned to one of the three counselors doing the extensive counseling. identified as Control Group 1 (C1), Control Group 2 (C2), and Control Group 3 (C3).

3. Unidentified and assigned to counselors other than the three doing the intensive counseling.

In terms of the experimental treatment, the three cooperative counselors agreed to provide the following counseling services: (1) Attempt to establish and maintain regular contact with these students; (2) Hold a minimum of three counseling sessions with each student; and (3) Utilize all resources of the college to assist the student to stay in college. When compared with their respective control groups, the attrition rate was reduced for students in the third Experimental Group ($p < .16$), reenrollment rate was increased both for students in the first Experimental Group ($p < .10$), and for students in the second Experimental group ($p < .10$). As a total group those student who were so identified to the counselors (E1 plus E2 plus E3) have a higher reenrollment rate than those who were no so identified ($p < .10$). There was a clear and consistent trend for a higher proportion of the identified students to stay in college during the fall term and to reenroll, as compared with the unidentified students in the experimental counselors' case load. There was a difference between the performance of the three counselors. The attrition rate for the control groups was lower than the attrition rate for the previous fall's potential dropouts at San Jose City College. It is recommended that the feasibility of prediction be further investigated, that further factors be identified, and if there is shown a sufficiently valid base for identifying potential dropouts that the information be made available for counseling prior to the first enrollment, and that the individual factors which suggest potential for dropout be reported to counselors for possible direct action.

Shasta College (Mr. Walter Brooks):

The specific purpose of the Shasta College project was to develop a minimal treatment model for reducing attrition. A true experimental design was conducted. All students receiving a plus ten (+10) or higher score on the Sum-1 index determined by scoring the Nor Cal pre-enrollment questionnaire were included in the study group. One hundred and twelve (112) students were identified as potential dropouts. They were randomly assigned to experimental and control groups. Thus, two groups of fifty-six (56) were identified. The male to female ratio, the number of college "units attempted," and the registration dates were virtually the same for the two groups. Students in the experimental group received by letter an invitation to see their counselor to "discuss college course work and education plans." This letter was signed by the potential dropout's counselor. No such letter was mailed to students in the control group; in fact, counselors were not told the names of the students in the control group. When a potential dropout in the experimental group appeared for his appointment with the counselor, the

counselor began a semi-standardized and structured interview during which time the counselor told the student frankly that he had been identified as a student who was likely to withdraw from college. He was told that the indication that he would drop out was merely a statistical phenomenon and was by no means predictable in his particular case. The counselor was encouraged to deal with problems identified in the interview as he would with problems of any student who asked for such help on his own. Comparisons between the students in the experimental group who received specialized individual attention from their counselors versus those who did not indicated that those in the experimental group reenrolled at a higher rate ($p<.01$), and had a lower attrition rate ($p<05$). On the variable of attrition rate several comparisons were made. The potential dropouts in the experimental group had a lower attrition rate than the potential dropouts in the control group ($p<.05$). The experimental treatment was so salient, in fact, that a comparison of the attrition rate of those potential dropouts in the experimental group with the attrition rate for all students who scored below plus ten (+10) on the Nor Cal questionnaire (were not identified as potential dropouts), produced no significant differences. In fact, the attrition rates were exactly the same. The comparison of attriton rate between potential dropouts who were in the control group versus all students who scored below plus ten (+10) on the Nor Cal questionnaire revealed that those in the control group had a much higher attrition rate ($p<.01$). Identifying potential dropouts to members of the counseling staff, providing individual letters to the potential dropouts from their counselor was to be an effective experimental procedure. Thus, a treatment model requiring a minimum of staff time and cost can have a significant effect on the persistence and general performance of potential dropout students. It is recommended that Nor Cal questionnaire be administered as part of the college orientation program at Shasta College and that students identified as potential dropouts be dealt with in the manner indicated in the study.

Sierra College (Mr. Martin Taylor):

Both a true experimental design and a quasi-experimental, post-hoc design were conducted. At the beginning of the fall 1970 semester, each first-time freshmen completed the Nor Cal questionnaire and potential dropouts were identified. For the true experimental design, potential dropouts were randomly assigned to experimental and control groups. Those in the experimental group received personal letters from the counseling center and were seen there from one to eight times in individual interviews. Students in the control group were not so treated nor were they identified to the counseling staff. Those in the experimental group attained a higher grade point average by .25 of a grade point ($p<.07$) and reenrolled at a higher rate ($p<.10$). There were significantly more honor students in the experimental group than in the control group ($p<03$). In conclusion, it would appear that identification of potential dropouts to the counselors and the requiring of even a minimal number of counseling contracts early in the semester does result in improved performance.

Summary 3: Summary of Findings From College Programs Which Used a Quasi-Experimental Research Design During Phase 3

Second to be considered are those college programs that were conducted under the rubric of a quasi-experimental research design. A listing of these colleges is shown in the table below. After the table is a brief description of each college's findings.

TABLE

Colleges Using Quasi-Experimental Research Designs

College	Treatment Variables
College of the Sequoias	Six-Week Instruction and a Financial Grant
Contra Costa College	Special Courses or Student Services
De Anza College	Special Counseling
Foothill College	Special Courses or Student Counseling
Merced College	Group Counseling
Reedley College	Student Services
Sierra College	Special Courses

College of the Sequoias (Mr. Richard Jacobsen and Dr. Lincoln H. Hall):

Two groups were selected and compared. One group was a "non-colelge Mexican-American group," the other group was matched with this group on the Nor Cal Sum-1 index and ethnic background. A special six-week instructional program was held at the College of the Sequoias. In addition, $60 per month grants and tutoring assistance were provided. At the end of the first semester, the experimental group had completed fewer units ($p<.15$), had lower grade point averages ($p<.02$), and had higher attrition rates ($p<.14$). The performance for the experimental group during the first semester would indicate that the selection process had accurately identified the students who would have difficulty. After completion of the first semester the indicators of academic success showed no statistically significant differences between the experimental and control groups as indicated by reenrollment for the second semester, units completed after second semester, second semester grade point averages, and attrition rate during second semester. The lack of significant differences during the second semester strongly suggests that by this time the experimental group program was effective in reducing educational handicaps. Continued observation of the control and experimental groups would shed additional light on the educational value of the special program for the disadvantaged.

Contra Costa College (Miss Phyllis Goldman):

A post-hoc study was done to see if special programs already in operation at Contra Costa College were effective in helping potential dropouts. All together there were sixty-two (62) potential dropouts who availed themselves of special programs already in operation, and thirty-eight (38) potential dropouts who did not avail

themselves of any of the special programs. The sixty-two (62) students in the experimental group availed themselves of counseling services other than financial aid and programming, took one or more ethnic studies courses, took a basic 101 Study Skills Course, used tutoring services, received financial aid and tutoring, or received financial aid plus one or more of the above except tutoring, or received one or more of the above except financial aid. The potential dropouts who used one or more of the special services or programs did persist to a significantly greater extent than those who used none of the services ($p<.01$). For those who availed themselves of the special programs, the reenrollment rate was higher ($p<.01$), the number of units completed was higher ($p<.01$), and the grades were significantly better ($p<.10$). The largest sub-group within the experimental group of sixty-two (62) students was the group of students who took the "Basic Skills" 101 courses. Students who availed themselves of this special program had lower attrition rates ($p<.01$), and higher reenrollment rates ($p<.05$) than did the control group, none of whom availed themselves of the "Basic Skills" courses. Financial aid seemed also to be a variable that was associated with improved performance. Those students who received financial aid did have a lower attrition rate ($p<.01$).

Thus, the study at Contra Costa College indicated that special aids and program already in operation did help students to remain in school longer and to make more academic progress than would be the case without such programs. Because of the small numbers involved in the experimental sub-groups, the study was not able to distinguish which particular aids were most effective. However, the figures suggest that each of them taken together do make a difference and taken separately, the "Basic Skills" 101 course and financial aids were potent. A disturbing question however, remained: "Why did one-third of the potential dropout entrants not avail themselves of any of the special services or programs offered by Contra Costa College?" This fact indicates that a significant portion of potential dropouts did not find their way into the special programs already in operation.

De Anza College (Mr. David Shaw):

Potential dropouts were identified to De Anza College counselors as high risk students and were listed on a separate sheet for each counselor. Counselors contacted their students and performed those activities they deemed appropriate in terms of assisting potential dropouts to remain through the fall quarter. It was discovered in post-hoc fashion that those students who did persist did see their counselor more often than those who withdrew during the fall quarter ($p<.025$). Chi square analysis indicated that two variables, the number of visits to a De Anza College counslor and withdrawal rate, were related ($p<.05$). There may have been a tendency for potential dropouts to distribute themselves non-randomly among counselors ($p<.10$), but comparison of attrition rates of potential dropouts by counselor was not significant. A comparison was made between the attrition rate of all potential dropouts, those having Sum-1 scores above plus ten (+10), with the attrition rate of those having Sum-1 scores below plus ten (+10). The attrition rate was not significantly different in the two groups ($\phi=.04$). However, the potential dropouts did complete fewer units ($p<.01$), and obtained a lower grade point average ($p<.01$) for the fall quarter. One possibility for the lack of continuance of the validation on the variable of attrition is that students who received the potential dropout score on the Nor Cal survey were identified early to the counselors and several, perhaps all, of the courselors treated these students

differently. It is a possibility that this intervention, as minimal as it was, was sufficient to improve the persistance rate of the potential dropouts. In a further effort to discover what De Anza College may have done that helped potential dropouts, the Nor Cal Services questionnaire was mailed to all potential dropouts. Analysis of the results indicated that the following were helpful:

1. "Participation in an encounter group or counseling group meeting regularly to improve interpersonal relationships."

2. "Assistance from a student employed by the college to advise students in class selection."

3. "A reading course or laboratory to help in reading skill development."

4. "A math course or laboratory to help in math skill development."

If De Anza College participates in future Nor Cal projects, it would be appropriate that the college enter into more traditionally experimental design in attempting to treat specific problems of specific groups rather than use the approach that was used this time.

Foothill College (Mr. Irel D. Lowe):

A post-hoc analysis was undertaken at Foothill College since a number of programs designed to aid potential dropouts had been started or amplified during the 1970-71 school year. The special programs included: Study Skills Center in language and mathematics areas, a tutoring program in all divisions, a group counseling program, expanded financial aid program, and expanded counseling for the disadvantaged students. A Nor Cal Services questionnaire was mailed to all potential dropouts and the results indicated that the following were helpful:

1. "A reading course or laboratory to help in reading skill development;"

2. "A writing course or laboratory to help in writing skill development;"

3. "A mathematics course or laboratory to help in mathematics skill development;"

4. "Assistance from a student tutor employed by the college to help in one or more of the courses;"

5. "Assistance from a counselor or advisor in planning a college major;"

6. "Assistance from a counselor or advisor in selecting specific classes;" and

7. "Financial aid in the form of a grant or loan provided by the college."

While secondary validation of the Nor Cal questionnaire was done for students at Foothill College, Fall quarter 1969, that indicated that students whose Sum-1 scores were above plus ten (+10) did withdraw at a higher rate than students whose Sum-1 scores were below that figure, the same attrition rate comparison did not

produce statistically significant differences in the 1970-71 school year. Potential dropouts did, however, complete fewer units ($p<.01$), and did attain a lower grade point average ($p<.01$). It appeared that the programs that had been started or amplified at Foothill College during the 1970-71 school year may very well have had an impact on reducing attrition rate of potential dropouts, and the results of the services questionnaire indicate that many of the activities that Foothill College performed are viewed by potential dropouts as being helpful.

Merced College (Mr. James Rand):

Incoming students at Merced College completed the Nor Cal questionnaire during the intial stage of registration for fall semester. A temporary shortage of questionnaires resulted in a total potential dropout group of 50 students. Necessary screening of this group produced a total of 22 students. It was decided that all of these potential dropout students would be included in the group counseling class that was to serve as the primary independent variable. The potential dropouts should have had a statistically significant higher attrition rate than the other students. However, a comparison of attrition rates of potential dropouts who were in the small group counseling session and all other entering freshmen students proved not to be statistically significant. It may be that the treatment was salient in reducing the group's attrition rate; however, various factors preclude any firm interpretation of these results. Merced College is planning to broaden the range of services available to the potential dropout student. Included in the expanded program will be a tutorial center and more group guidance offerings. An attempt will be made to coordinate guidance, instructional, and tutorial services in a way that will allow for a more immediate, intensive and comprehensive support program. It is hoped that this more comprehensive approach will be able to respond to the needs of the prospective dropout regardless of what his unique problems may be.

Reedley College (Mr. Robert Clark):

Three kinds of studies were conducted for Reedley College. The first was a true experimental design. The second was a post-hoc, quasi-experimental design, and the third was a validation study. As part of the quasi-experimental design, comparisons were made on attrition rate, reenrollment rate, grade point average including dropouts, grade point average excluding dropouts, and units completed for five experimental, on-going programs. The five programs included: E.O.G. grants, E.O.P.S. grants, scholarships, tutoring, and individual counseling. Those who received E.O.P.S. grants did attain a lower grade point average than those who did not ($p<.025$). Students who received tutoring had a lower attrition rate ($p<.10$), and a higher reenrollment rate ($p<.15$). Those students who were involved in individual counseling had a lower attrition rate ($p<.01$), had a higher reenrollment rate ($p<.01$), and completed more units ($p<.015$). It is recommended that evaluation continue on experimental and quasi-experimental treatment conditions until all members of experimental and control groups are no longer in attendance.

Sierra College (Mr. Martin Taylor):

Both a true experimental design and a quasi-experimental, post-hoc design were conducted. At the beginning of the fall 1970 semester, each first-time freshmen completed the Nor Cal questionnaire and potential dropouts were identified. The post-hoc analysis investigated the performance levels of students enrolled in Counseling 70, Interpersonal Relations, and those enrolled in Counseling 75, Study Skills. Among the total potential dropout group, the reenrollment rate the following semester for students enrolled in either class was significantly higher ($p<.01$). The grade point average was also significantly higher for those in counseling 75 and for those in Counseling 70 ($p<.05$). When comparisons were made between those who took Psychology 70 and those who did not, it was learned that those who took Psychology 70 had a lower rate of attrition ($p<.15$), had a higher rate of enrollment for the next term ($p<.01$), attained a higher grade point average ($p<.05$), and completed more units ($p<.05$). When those students who took Counseling 75 were compared with those students who did not take Counseling 75, it was learned that those who took the course had a lower attrition rate ($p<.15$), a higher reenrollment rate ($p<.01$), a higher grade point average ($p<.10$), and completed more units ($p<.08$). However, since enrollment in the two courses, Counseling 70 and Counseling 75 was voluntary and not randomized, these figures may arise from original differences between the two groups. In conclusion, there is some evidence to suggest the enrollment in Counseling 70 or 75 may be related to retention and better performance.

Section 4: Summary of Findings From College Programs Which Conducted a Validation Study During Phase 3

Third to be considered are those college programs that were conducted as validation studies. A listing of these colleges is shown in the table below. After the table is a brief description of each college's findings. At the end of this section is a table that summarizes the statistics which emerged from these validation studies.

TABLE

Colleges That Conducted a Validation Study of the Nor Cal Instrument During Phase 3

American River College	Reedley College
Chabot College	Santa Barbara City College
Diablo Valley College	Solano College
Napa College	

American River College (Mrs. Lorine Aughinbaugh):

Both a validation study and an experimental design were conducted. In terms of the validity study, it was learned that the Nor Cal questionnaire is a valid instrument for determining which students, among all those who say in the spring that they will attend college, will be "no shows" that coming fall ($p<.0001$).

Chabot College (Mr. David Guzman):

A post hoc validation study of the Nor Cal questionnaire was undertaken. Performance levels of potential dropouts, those with plus ten (10) Sum-1 socres or higher, were compared with performance levels of students with minus ten (-10) Sum-1 scores or below. Potential dropouts had a higher attrition rate ($p<.06$), attempted fewer units ($p<.005$), and completed fewer units ($p<.005$). Of those students who filled out the Nor Cal quesionnaire in late August, the potential dropouts had a significantly higher "no-show" rate ($p<.10$). In addition to the validation study, a study was conducted by the office of the Associate Dean of Student Personnel to ascertain reasons for withdrawal between the fall and winter quarters.

Diablo Valley College (Mr. William Preston):

Reluctance on the part of members of the Counseling Division to provide special attention for students identified by the Nor Cal questionnaire as potential dropouts prevented the investigation of a true experimental design as was planned by Diablo Valley College for Phase 3. It is clear that successful adoption of any new program or procedure is heavily dependent upon the proper laying of groundwork for its acceptance by those whom it involves or effects. A validation study of the instrument was undertaken as it related to incoming Diablo Valley freshmen in hope that if the instrument could be shown to be valid, sufficient support from the Counseling Division could be obtained so that in the future potential dropouts could receive special attention. While the cutting score on the Sum-1 index of plus ten (+10) did not produce significant differences in attrition rate, the use of plus eighteen (+18) on the Sum-1 did identify a group of students whose attrition rate was significantly higher than that of other students. ($p<.001$).

Napa College (Mrs. Gladys E. Dallas and Mrs. Virginia Murdoff):

Two kinds of studies were conducted by Napa College. The first was a true experimental design, and the second a validation study. The validation study at Napa College consisted of those students who were identified as potential dropouts by the Nor Cal questionnaire. The second group of students were matched with the Nor Cal identified potential dropouts on the variables of ACT test scores and sex. The comparisons were made after fall quarter and after winter quarter. Students identified by the Nor Cal questionnaires as potential dropouts did have a higher attrition rate after fall quarter ($p<.01$), a lower reenrollment rate after fall quarter ($p<.01$), a higher attrition rate after winter quarter ($p<.001$), and a lower

reenrollment rate after winter quarter ($p<.001$). The Nor Cal identified potential dropouts completed fewer units after fall quarter ($p<.005$), completed fewer units after winter quarter ($p<.005$), had lower grade point averages after fall quarter ($p<.005$), and had lower grade point averages after winter quarter ($p<.005$). There are two lessons to be gained from the Phase 3 Nor Cal Study as accomplished in Napa College; special counseling did help potential dropouts, and the Nor Cal questionnaire is valid.

Reedley College (Mr. Robert Clark):

Three kinds of studies were conducted for Reedley College. The first was a true experimental design. The second was a post-hoc, quasi-experimental design, and the third was a validation study. The validation study conducted at Reedley College compared attrition, grade point average, and units completed of three groups: those who scored plus ten (+10) and above, those who scored minus ten (-10) and below, and those who scored between minus ten (-10) and plus ten (+10) on the Nor Cal Sum-1 index. Potential dropouts did drop out at a higher rate (p .001); did achieve a lower grade point average ($p<.0005$); and did complete fewer units ($p<.0005$). It is recommended that evaluation continue on experimental and quasi-experimental treatment conditions until all members of experimental and control groups are no longer in attendance.

Santa Barbara City College (Dr. Thomas F. MacMillan):

A validation study was conducted. For the seventy-eight (78) entering students identified as being potential dropouts, the potential dropout's responses on the Nor Cal questionnaire provided the following descriptive information. The emotional climate of the potential dropout was clearly indicated by comparisons of the three criteria: goal for college, parental encouragement, and importance of college to self. Not one potential dropout felt college was important to him. Over twice the parental encouragement was found for the total sample as for the potential dropout. Over twice the total sample were seeking a transfer goal. Over twice the poportion of potential dropouts were undecided about a major. The validation study consisted of following the seventy-eight (78) potential dropouts through the fall 1970 semester at Santa Barbara City College. The intent was to observe whether a greater proportion of these students would withdraw from college than the average 7.47% attrition found in the 1968 sample of the Nor Cal colleges. The figures showed that over one-third of the students with the characteristics of potential dropouts did not even enter Santa Barbara City College. All total, fifty-five (55%) percent of the potential dropouts either failed to enter at all, withdrew, or were on academic probation by the end of their first semester. These findings at Santa Barbara City College suggest that potential dropouts can indeed be identified early so that special programs can be provided for them as deemed necessary and appropriate. Although programs that presently operate, including the tutorial program, might have been helpful to these potential dropouts, it should be noted that none of the forty-five (45) entering potential dropout students received tutorial assistance in the tutorial center although they might have if early identification and referral had taken place. Also, only five (5)

of the forty-five (45) students took Psychology 29, 30, or 33; any one of which might have been responsive to the particular need of potential dropouts. Experimental treatments that might make a difference include direct financial aid, recruitment tutorial services, summer readiness programs, tutorial center services, and the psychology courses mentioned above. In summary, the study undertaken at Santa Barbara City College indicates that the questionnaire was valid in terms of identifying potential dropout students; that on-going special programs that presently exist were not reaching potential dropout students; and that the true experimental model used in the larger Nor Cal colleges would be appropriate for the future.

Solano College (Mr. Dean Eaton):

A validation study was undertaken in which two groups were compared: (1) Potential dropouts, those who scored plus ten (+10) or higher on the Sum-1 index; and (2) Those who scored minus ten (-10) and below on the Sum-1 index. Comparisons were made after the fall semester, between fall semester and spring semester, and after spring semester. Those students identified by the Nor Cal questionnaire as being potential dropouts did have a significantly higher attrition rate after fall semester ($p < .001$), and after spring semester ($p < .0012$). Potential dropouts so identified did reenroll at a lower rate ($p < .025$). Potential dropouts did complete fewer units after fall semester ($p < .005$), and after spring semester ($p < .005$). Potential dropouts did attain a lower grade point average ($p < .0005$). It is recommended that in the 1971-72 school year that entering full-time, first-time freshmen be given the Nor Cal questionnaire so that identification of potential dropouts can be made. The identification should be followed by experimentation to see if it is possible to find an effective holding power program.

TABLE

Summary of "Attrition Rate" Comparisons
for the Third Validation Study

College	Measurement Taken	Attrition Rates: Group A Sum-1 +10 or Above	Attrition Rates: Group B Comparison Group	z Value	Significance Level p
American River College[1]	At the beginning of the Fall 1970 Term	53.06%	25.47%	5.63	.0001
Chabot College	At the end of the Fall 1970 Term	51.0%	35.7%	1.58	.06
Diablo Valley College[2]	At the end of the Fall 1970 Term	39.7%	29.5%	3.36	.001
Napa College[3]	At the end of the Fall 1970 Term	45.0%	10.0%	2.48	.01
Reedley College	At the end of the Fall 1970 Term	19.3%	6.1%	2.3	.02
Santa Barbara College[4]	At the end of the Fall 1970 Term	37.0%	7.47%	not calculated	
Solano College	At the end of the Fall 1970 Term	23.4%	2.1%	3.09	.001

[1] A "no show rate" was used for ARC.

[2] A "cutting score" of +18 was used for DVC.

[3] The comparison group at Napa College was composed of students who matched the Nor Cal identified potential dropouts on the variables of ACT score and sex.

[4] The 7.47% rate is the average attrition rate in the Nor Cal Consortium. The 37.0% rate is the attrition rate for 77 potential dropouts (those having scores of +10 or above).

Section 5: Summary of Findings From College Programs Which Used Neither an Experimental or Quasi-Experimental Research Design and Did Not Conduct a Validation Study

Fourth to be considered are those programs which used neither an experimental or quasi-experimental research design and did not conduct a validation study. For Yuba College and Sacramento City College, brief descriptions follow.

Yuba College (Mr. Elbert Miller):

The Nor Cal questionnaire was filled out at the two largest feeder high schools by students who stated that they would probably attend Yuba College the following fall. Many of the individuals who had planned to come did not, in fact, enroll. Thirty-six (36) potential dropout students did, however, attend Yuba College in the fall. A special counseling staff meeting was held describing the questionnaire results and counselors were urged, if the occasion presented itself, to give special attention to these potential dropout students. A control group was not used. Although the attrition rate of potential dropouts was somewhat higher than that of all other freshmen, the significance level ($p < .17$) was somewhat low. It should be remembered that the potential dropouts may have been treated as a result of the encouragement given in the one counseling staff meeting. Although the findings are generally inconclusive, attempts to identify and help potential dropouts appear valuable.

Sacramento City College (Mr. Elbert L. Kinnebrew and Mr. William A. Smith):

Mr. Elbert L. Kinnebrew, Assistant Dean of Research and Development and the representative from Sacramento City College to the Nor Cal Consortium, was in Washington, D.C. serving as a governmental intern at the American Association of Junior Colleges national office. In his absence, Mr. Kinnebrew suggested that Mr. William A. Smith, Coordinator of Special Programs at Sacramento City College, provide information on the SB164 programs as these generally "represent the best efforts in the area of treatment programs that exemplify real holding power." Mr. Smith forwarded the June 1971 progress report on the Sacramento City College SB164 program. Anyone wishing a copy of the final report need only write to Mr. Smith.

For more information from the other college's activities, the reader is referred to:

Kester, Donald L. "The Lesson of the Three Year Nor Cal Attrition Study: Many of the Potential Dropouts can be Helped," in ERIC. ED 057 771 (200 pages) (Pub. Date: July 1970)

Section 6: Summary of Some of the Findings From Phase 3:

1. Twelve colleges that employed a true experimental research design reported differences between treatment and control groups in the number of students withdrawing during the first semester or quarter of attendance. All colleges reported fewer student withdrawals among those students who were in the experimental group. Six of the colleges reported significance levels at the 5% level of confidence or greater.

2. All twelve colleges employing an experimental design reported differences between treatment and control groups in numbers of students reenrolling for a second term of college. All colleges reported more students reenrolling among students who were in the experimental group. Eight of the twelve reported significance levels at the 5% level of confidence or

greater. This finding suggests that the effects of the treatment conditions may become more apparent with the passage of time. It was considered an extremely important finding to discover that the effects of the treatment tended to persist after the treatment had ceased.

3. Of the twelve colleges employing an experimental design, six reported differences in grade point average between experimental and control groups. All six reported higher grades among students in the treatment groups but only two reported differences significant at the 5% level of confidence. Grade point average is an important measure of student success, but it was not the primary focus of the study. Of the three commonly used measures of attrition, grade point average may be the least reliable. It may be considered unreliable in part because colleges compute grade point averages differently. Some colleges allow the withdrawing student an extended grace period, while others assign failing grades upon irregular withdrawal early in the semester. Even where colleges have similar grading patterns, a problem may exist in interpreting the meaning of a grade point average with regard to the attrition study. If a student in the control group withdraws, he would probably not be assigned grades for that term. His grades would not be counted in the group average. If, on the other hand, a student in a good experimental program stays throughout the semester in spite of poor grades, his grades are counted in the average. This would, of course, tend to pull the overall grade point average of the group down. It is not known that this occurs in every case, and certainly good grades are an important part of many of the experimental programs.

4. All colleges reporting a successful treatment program included counseling in their procedures. As the reader will recall, the two best indicators of early withdrawal were the factors of: (a) SexAbility, and (b) Motivation. Of the two, motiviation was more heavily weighted, as regression analysis showed, motiviation included the items of (1) Level of educational and vocational goals, (2) Level of parental encouragement for college attendance, and (3) the level of the student's perception of the importance of his attending college. It may be that counselors can provide encouragement to potential dropouts in such a way as to help them to change the withdrawal prone factor of motivation and thereby enable students who were dropout prone to become actual persisters. Of course the novel addition the Nor Cal study made was the early identification of potential dropouts. With the computer printout data available to counselors during the initial weeks of the fall term, the counselors could begin to work with those already diagnosed. Counselor intuition is probably not as good an identification scheme as the use of a validated diagnostic questionnaire.

5. Almost all community colleges have within their present course structure and student services the potential for significantly reducing attrition among first-semester freshmen. Only a few of the participating colleges introduced new courses or procedures during the third, experimental phase of the attrition study. At the onset of the study, it was felt that this

might be a weakness. In the final analysis, however, this must be considered one of the strengths. The community colleges participating in the three-year study represent a real range of colleges from rural Shasta and Sierra to metropolitan San Francisco City and Merritt. It is important to recognize that a wide variety of colleges found that the resources were already available to do the job.

When one is called upon to ask whether the new students in community colleges can be afforded the means to academic survival, there is no more extensive documentation of an affirmative answer than the finding of the Nor Cal study. The problem of attacking early and excessive attrition of community college freshmen is clearly one of desire. This is surely one of the most important contributions of the Nor Cal Attrition Reduction effort.

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